

What is claimed is:

1. A noise light elimination method for eliminating noise light components contained in a signal light,

wherein a stimulated Brillouin scattering generating medium that generates a return light due to stimulated Brillouin scattering when a light having a power exceeding a threshold value is input, is applied with a signal light that has been amplified up to a power exceeding said threshold value, and the return light generated by the stimulated Brillouin scattering generating medium is extracted as a signal light, to thereby eliminate the noise light components contained in the signal light.

2. A noise light elimination method according to claim 1,  
 wherein a power of the return light generated by said stimulated Brillouin scattering generation medium is adjusted.

3. A noise light elimination apparatus for eliminating noise light components contained in a signal light, comprising:

a stimulated Brillouin scattering generating medium that generates a return light due to stimulated Brillouin scattering when a light having a power exceeding a threshold value is input,;

an optical amplifying section that amplifies a signal light up to a power exceeding said threshold value; and

an optical input/output section that applies the signal light amplified by said optical amplifying section to said stimulated Brillouin scattering generating medium, and extracts the return light generated by said stimulated Brillouin scattering generating medium as the signal light.

4. A noise light elimination apparatus according to claim 3, further comprising;  
 an adjusting section that adjusts a power of the return light generated by said stimulated Brillouin scattering generation medium.

5. A noise light elimination apparatus according to claim 4,  
 wherein said adjusting section includes an optical amplifier that amplifies said return light.

6. A noise light elimination apparatus according to claim 4,  
wherein said adjusting section includes an optical attenuator that attenuates said return light.
7. A noise light elimination apparatus according to claim 4, further comprising:  
a detection section that detects a power of the return light output from said adjusting section; and  
a control section that controls an operation of said adjusting section based on a detection result of said detection section.
8. A noise light elimination apparatus according to claim 3,  
wherein said stimulated Brillouin scattering generating medium is provided in a form of an optical transmission path.
9. A noise light elimination apparatus according to claim 8,  
wherein an optical fiber is used for said stimulated Brillouin scattering generating medium.
10. A noise light elimination apparatus according to claim 8,  
wherein an optical waveguide is used for said stimulated Brillouin scattering generating medium.
11. A noise light elimination apparatus according to claim 8,  
wherein another end of said stimulated Brillouin scattering generating medium positioned on an opposite side to one end to which the signal light amplified by said optical amplifying section is input, is subjected to non-reflection termination treatment.
12. A noise light elimination apparatus according to claim 3,  
wherein said optical input/output section comprises an optical coupler having at least three ports, and an optical isolator, and the signal light amplified by said optical amplifier is input to a first port of said optical coupler and output from a second port of said optical coupler to said stimulated Brillouin scattering generation medium, and the return light generated by said stimulated Brillouin scattering generation medium is input to the second port of said optical coupler and branched into two to be output from the first port and a third port, respectively, and transmission of the return

light output from the first port of said optical coupler to said optical amplifying section is blocked by said optical isolator.

13. A noise light elimination apparatus according to claim 3,  
wherein said optical input/output section includes an optical circulator arranged between an optical output end of said optical amplifying section and an optical input end of said stimulated Brillouin scattering generating medium.

14. An optical transmission system for amplifying a signal light sent from an optical transmission device to an optical transmission path, by optical repeaters arranged on the optical transmission path, to repeatedly transmit the signal light to an optical receiving device, comprising;

at least one of the noise light elimination apparatus recited in claim 3 on the optical transmission path.

15. An optical transmission system according to claim 14,  
wherein said optical receiving device includes a demultiplexer that demultiplexes the signal light transmitted on said optical transmission path, in accordance with a wavelength thereof, and said demultiplexer has filter characteristics where a center wavelength of a transmission band is set in accordance with a wavelength shift amount due to stimulated Brillouin scattering occurring in said noise light elimination apparatus.

16. An optical transmission system according to claim 15,  
wherein said demultiplexer includes an arrayed wave guide grating capable of adjusting the filter characteristics.